

CLAIMS

What is Claimed:

- 5
1. A bag comprising a multilayer structure comprising:
 - 10
 - I. a multilayer tear resisting composite plastic film structure consisting essentially of:
 - a) an oriented polymer film layer having a top surface and a inner surface;
 - 15
 - b) a thermal bonding polymer layer on the oriented polymer layer inner surface substantially coextensive thereto, the thermal bonding polymer layer having a thickness between 10% and 40% of a combined thickness of the oriented polymer film layer and the thermal bonding polymer layer; and
 - 20
 - c) a reinforcing scrim polymer layer also having an inner surface adjacent and substantially coextensive with the thermal bonding polymer layer; and
 - II. at least one additional layer adhered to said multilayer tear resisting composite structure;
 - 25
 - wherein the polymer film layer, the bonding polymer layer and the reinforcing scrim in said multilayer tear resisting composite structure all have a chemical composition that permits recycling said composite without separating the layers thereof, and wherein said multilayer structure forms said bag.
 - 30
 2. The bag according to claim 1 wherein the combined thickness of said polymeric layer and said bonding layer is between about 0.0002 inches and 0.003 inches.
 3. The bag according to claim 2 wherein said at least one additional layer is a paper layer adhered to an outer surface of said scrim layer and comprises an exterior surface of said bag.

4. The bag according to claim 3 wherein both said paper layer and said multilayer tear resisting composite structure are translucent in at least a portion of said bag.

5 5. The bag according to claim 2 wherein said at least one additional layer comprises an inner and an outer paper layer adhered to each other, said inner paper layer being the layer also adhered to said multilayer tear resisting composite structure, said inner paper layer being heavier than said outer paper layer.

10 6. The bag according to claim 2 further wherein said at least one additional layer comprises at least two paper layers adhered to said multilayer tear resisting composite structure, a first of said at least two paper layers adhered to said top surface of said multilayer tear resisting composite structure and a second of said at least two paper layers adhered to an outer surface of said scrim layer.

15 7. The bag according to claim 6 further comprising an additional plastic film layer adhered to said second of said at least two paper layers forming an innermost layer of said bag.

20 8. The bag according to claim 2 wherein said at least one additional layer comprises a composite structure comprising a first film layer and a low density polyethylene layer adhered thereto.

25 9. The bag according to claim 8 wherein said low density polyethylene layer also serves as an adhesive to adhere said composite structure to one or both of said first film layer and said multilayer tear resisting composite structure.

10. The bag according to claim 9 wherein said first film layer is a polyethylene film layer.

30 11. The bag according to claim 9 wherein said first film layer is a biaxially oriented polypropylene layer.

35 12. The bag according to claim 1, wherein the oriented polymer film layer, the thermal bonding polymer layer, and the reinforcing scrim polymer layer in said

multilayer tear resisting composite structure each individually comprise a synthetic condensation polymer,

5 the synthetic condensation polymers each comprising, in polymerized form:

1) a) a carboxylic acid or a mixture of carboxylic acids, and
b) either i) a diamine or a mixture of diamines, or ii) a diol or a mixture of diols, or

10 2) an ω -amino acid having more than 2 carbon atoms, or a mixture of such amino acids,

wherein, for the composite taken as a whole,

15 at least 90 mol% of a combined total amount of the carboxylic acid or the mixture of carboxylic acids in the synthetic condensation polymers is the same carboxylic acid,

20 at least 90 mol% of a combined total amount of the diamine or the mixture of diamines in the synthetic condensation polymers is the same diamine,

at least 90 mol% of a combined total amount of the diols or the mixture of diols in the synthetic condensation polymers is the same diol, and

25 at least 90 mol% of a combined total amount of the amino acid or the mixture of amino acids in the synthetic condensation polymers is the same amino acid.

30 13. The bag according to claim 12, wherein the oriented polymer film layer comprises biaxially oriented polyethylene terephthalate.

14. The bag according to claim 2 wherein said bag comprises an opening side and wherein said opening side further comprises a closure comprising an pattern molded on an inner surface of said multilayer structure .

35

15. The bag according to claim 14 wherein said molded pattern is part of a zipper closure.

16. The bag according to claim 2 wherein the oriented polymer film layer,
5 and the thermal bonding polymer layer are co-extruded layers.